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Perkins Green III: proposed married and graduate student housing

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Perkins Green III
Proposed Married and Graduate Student Housing

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I. Introduction

A. Occurrence of the Problem

B. Observation

C. Motivation

A. Occurrence of the problem

When I first came to Rochester Institute of Technology (R.I.T.) to study in the graduate program, I settled in an apartment supported by the school, because I was a new-comer and knew nothing about the surroundings. Racquet Club, a housing complex five minutes from school, is a 307-unit-townhouse-apartment, student housing area with three tennis courts and one large grass slope as its open space. I was very satisfied by this beautiful scene and thought it would be a good place to live and study. Later, however, I found sometimes, especially on weekends, there was too much noise from parties taking place in adjacent apartments; band concerts taking place (or rehearsing) in an apartment, drinking, talking, and amazingly loud dance music, not to mention occasional fights. These behaviors piqued my curiosity at first, but later on really irritated me. Perhaps I had homework to do; perhaps I would like to enjoy a movie on TV, to listen to my favorite classical music, or to have a chat with my house-mates and have a cup of tea; but I was bothered by the noise. Fortunately, during the weekdays this normally didn't happen because everyone else was very busy.

B. Observation

In response to the above, I thought about the problems and discovered two important factors as follows:

1. Diversity of the culture

Due to my Asian cultural background, I couldn't understand and enjoy such music even for a short period of time. Some neighbors build bars in their apartments for their parties. Sometimes there were a few students standing outside with beers and talking to each other loudly because their living room was overflowing with people. I, however, would like to invite my friends to have dinner together. After the meal we usually have tea, watch TV, chat, or play card games. Generally speaking, Asian students' parties are more reserved

2. Diversity of age

I graduated from college when I was 22 years old. Then I was recruited and served two years in the military. After my time as a marine I held a job for two years before I came here. This means that when I first came to R.I.T., I was almost 27. I was not young and zealous for that kind of wild partying. Somehow, my thoughts were totally different from when I was younger. Some of my friends, who were also graduate students at R.I.T., whether foreign students or Americans, were of a similar age as me, and most of them preferred to live off-campus if they did not consider the distance and convenience

factors. The reason is for more privacy and better maintained apartments. This is true especially among American graduate students. However, there is also a higher proportion of married graduate students and they desire more privacy than others. I concluded that older, graduate, and married students are not compatible with younger, undergraduate students in a close living environment.

C. Motivation

Based on the issues mentioned above, and some of my observations and thoughts, I have developed a deeper insight:

In Taiwan, almost all the colleges provide dorms for those from other cities to avoid housing problems. They also provide dorms designed especially for graduate students. I think they must have based their decisions on housing facilities on evaluations and considerations similar to mine. From my interviews, I understood that Universities such as the University of Rochester and Memphis State University both have housing policies that separate graduate from undergraduate students. Most graduate students differ from undergraduate students in their age, maturity, and even family backgrounds. Living together in the same housing complex causes many problems as all the aspects mentioned above suggest. The problems would be much more severe if they lived in the same dormitory. Therefore, separate housing for graduate students and undergraduate students is a reasonable

consideration. At least, the school should provide this as an option for graduate students.

The current housing policy for R.I.T. does not consider the above. In other words, there is a need for R.I.T. to modify its housing policy and provide housing or dorms that are for graduate students only. Therefore, considering the special needs of graduate students, I decided to work on this project, whose goal is to provide graduate students an appropriate residential environment.

II. Collection of Information and Analysis

A. Background of the R.I.T. policy

B. Current usage and shortage of housing

C. Investigation of site conditions

D. Requirements of Building and Zoning Codes

E. Other

"The process of designing a building is really a path which you begin to travel as soon as you possibly can, in terms of the problem. On the path of that travel, you embrace as many problems and aspects of a project as possible."[1]

Kevin Roche is one of the most famous campus architects in the United States, and is one of the five architects who designed the R.I.T. campus. Just like him, I realized that this project includes both planning and designing from a large scale, like site planning, to a smaller scale of architecture and interior design. First of all, I prepared a flow chart (see Figure 1.) from a planner's point of view, in order to control the whole process of planning and design, and to determine the requirements of accuracy and practicality.

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[1] John W. Cook and Heinrich klotz, Conversations with architects (New York: Praeger Publishers, Inc., 1973), 82.

The residents of this proposed housing were to be graduate and married students, which prompted the consideration of planning and design different from the other housing and building design at R.I.T.

My method of collecting information was to directly contact related departments, describing my intent; asking for the information that I needed, and interviewing the persons who could be helpful to my research. Meanwhile, in order to know the residents' character better, I also prepared a questionnaire for a small sample survey. I, hereinafter, categorized my findings as follows:

A. Background of the R.I.T. Policy

1. About R.I.T. and Philosophy of Graduate Education:

   Consisting of eight colleges; Applied Science and Technology, Business, Continuing Education, Engineering, Imaging Arts and Sciences, Liberal Arts, Science, and the federally funded National Technical Institute for the Deaf, Rochester Institute of Technology was founded in 1829, and had been a pioneer in career oriented and cooperative work-study, higher education. R.I.T. includes a modern 1,300-acre campus and the R.I.T. City Center in downtown Rochester. The nonsectarian, coeducational, independent Institute prepares students for technical and professional careers in a changing world.

"Graduate education has been part of the mission of R.I.T. since the first graduate program in Fine and Applied Arts was begun in 1958. ... R.I.T. has stressed both '**earning a living and living a life**'. Its offerings have also emphasized the amalgam of formal education and experience, and have included a definitive commitment to career development in a context of social responsibility."[2] R.I.T. has been reaching its educational mission continuously, and it continues to receive international recognition for the quality of its programs as well as professional learning and training, not to mention "the quality of classroom teaching, opportunity for hands-on experience, and a campus atmosphere ..."[3] R.I.T. offers graduate students the best in classroom learning combining with a stimulating opportunity for applied research and experience. R.I.T. also offers the best facilities such as the Wallace Memorial Library, diverse student activities, athletics... and so on, "The four unfurnished apartment facilities—Colony Manor, Perkins Green, Racquet Club, and Riverknoll—are all different in layout and design, ... Although the majority of apartment residents are undergraduate students, a mixture of graduate and undergraduate and single and married students can be found in each apartment complex."[4] Unfortunately, R.I.T. did not seem to consider the best on-campus residential environment for

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[2]Rochester Institute of Technology, Office of Admissions, RIT, Graduate Study (Rochester, New York: Rochester Institute of Technology, 1992), 8.

[3]Ibid., 8.

[4]Ibid., 17.

graduate, married and older students. Even though they had considered that "... the fact of the co-existence on this campus of both day and evening schools would seem to call for an explicit separation of academic and dormitory facilities to provide day students with some degree of quiet, privacy and separateness in the evening."[5] Since they recognize the need of providing a quiet, private, and separate housing areas from main academic buildings, the housing policy does not seem to comply with the increasing number of undergraduate and graduate students. For example, a party is held by some vigorous undergraduate students, and a family (maybe a graduate student, his wife, and their new born baby) just lives next door. What if there were a lot of noise from the party? Would you think it is a good situation for both the partyers and the family? It is a fact that inconveniences exist in a mixed undergraduate and graduate student housing complex.

2. Long Range Development:

Until now, R.I.T. has reached its goals of the mid-range plan. According to the Mid-Range Master Plan, Building 76 (Chester F. Carlson Center for Imaging Science), Building 77 (Bausch and Lomb Center), Building 11 (Information Center), Building 23 (Hale-Andrews Student Life Center), and Building 5 (Wallace Memorial Library)

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[5]Mildred Schmertz, Campus Planning and Design, (New York: McGraw-Hill, 1972), 111.

expansion had been finished and opened. R.I.T. now has to reach its goals of long term development.

After reviewing the report of R.I.T. Land Use Plan Study Update, February 1987, I found it suggested that to conform to possible future developments, R.I.T. could reserve a vast amount of unused land for Research-Industrial Park and expand the Academic buildings from the existing academic core to the east and north area. Thus, Riverknoll, an existing housing complex, old and no longer suitable for use, would be removed. Building a new student housing complex becomes an important priority.

Since the master plan is always somewhat flexible within the constraints of existing undeveloped landscape, the development of R.I.T. still needs more careful consideration. But, the parking needs of R.I.T. are increasing day by day. The best solution is to move the students back to the campus. Obviously, expanding the student housing area has become the most important objective.

3. The Growth of the Graduate Student Body:

According to information provided by the Office of Admissions, R.I.T.'s student body consists of approximately 8,500 full-time and 3,000 part-time undergraduate students as well as 1,500 graduate students. Enrolled students represent all 50 states and 73 foreign countries.

Since 1912, R.I.T. has developed one of the country's strongest co-op programs. R.I.T.'s cooperative program is the fourth oldest and fifth largest in the world . Because of this cooperative program, the population of students changes slightly quarterly. For example, comparing the Enrollment Summary Report at Winter Quarter, December 21, 1990, and December 21, 1991, the total FTE (Full Time Equivalence = Full Time + Part Time/3) decreased by 2.5% and the Headcount student number decreased by 1.0%. The graduate student number grew 12% at FTE and 12.9% at Headcount.(See Table 1.)

Table 1. Comparison of Enrollment Summary by Winter Quarter, 902/ 912

	Year Level	902 12/21/90	912 12/21/91	Percentage of Increase
FTE	Graduate	791	886	+12.0
	Undergraduate	8135	7816	-3.9
	Total	8926	8702	-2.5
Headcount	Graduate	1559	1760	+12.9
	Undergraduate	10636	10316	-3.0
	Total	12195	12076	-1.0

Full Time Equivalence (FTE) = Full Time + Part Time /3. Students who are registered, but not consuming credit hours (e.g. Physical Education, ESOL), are excluded from FTE calculation.

Source: Pat Nelson, Assistant Registrar, January 3, 1992
Table made by Chou-Tein Lin

Another important consideration is foreign students. They must be considered because they mostly have to live in on-campus housing, and their population growth increased from 373 students in 1988 to 701 students in 1992. (See Table 2.)

Table 2. Increase of Foreign Students by Marriage status 87/88—91/92

	marriage Status	Undergrad.	%	Grad.	%	Other	%	Total	%
87/88	Single	201		104		31		336	
	Married	4		30		4		38	
	Total	205		134		35		374	
91/92	Single	391	95	217	109	45	45	653	94
	Married	6	50	37	23	5	25	48	26
	Total	397	93	254	89	50	42	701	87

Source: Open door data, International Student Affairs
Table made by Chou-Tein Lin

Table 3. shows the occupancy of R.I.T. Apartments and Residence Halls. Compare Table 1. with Table 3., there are at least 716 FTE graduate students who did not live on campus. Does this mean that most of them did not apply for an apartment on campus or they prefer to live outside of R.I.T.?

Table 3. 912 Occupancy of RIT Apartments and Residence Hall by Year Level

	Grad. / 6th year	5th year	1st-4th year	Total
Apartments	156	131	1846	2133
Residence Hall	14	71	2706	2791*
Total	170	202	4552	4924

* 913 Fall Quarter's number is 3278
Source: Department of Residence Life, Student Affairs Division
Table made by Chou-Tein Lin

B. Current Usage and Shortage of Apartment Housing

1. Apartments and Residence

Unlike most colleges located in metropolitan areas or in college towns which provide convenient transportation for students, R.I.T. occupies a large area in suburban Rochester and so must provide students with dormitories and apartments.

Other than the residence halls, which accommodate approximately 3,400 students within five living areas, four apartment complexes and nearly 1,000 apartments and townhouse units distinguish R.I.T.'s apartment community as one of the largest university operated apartment programs in the United States.

Table 4. shows that R.I.T. has 966 units of both apartments and townhouses, totaling 1,937 bedrooms. This means that they can accommodate at least 1,937 students, their spouses, and children.

However, Table 3. shows that during the Winter Quarter of 1991 there were 2,133 apartment residents in the above mentioned 1,937 bedrooms, showing that there's a slight shortage in living quarters. One of the apartment complexes, Racquet Club, isn't taken into consideration in the long term development plan; another apartment complex,

Riverknoll, might be dismantled and be used for possible academic expansion area.

Table 4. Quantity of R.I.T. Apartments

Name type	Racquet Club	Perkins Green I	Perkins Greens II	Colony Manor	River Knoll	Total
Efficiency	N	N	N	12	N	12
1 bedroom Apt.	102	30	N	34	112	278
2 bedroom Apt.	N	90	80	50	N	220
2 bedroom T.H.	N	N	N	64	97	161
3 bedroom T.H.	80	N	N	24	66	170
3 bedroom T.H. Deluxe	125	N	N	N	N	125
Total	307	120	80	184	275	966

Source: Apartment Management, Rental Office at Colony Manor
Table made by Chou-Tein Lin

Even though R.I.T.'s apartment facilities are one of the largest which are university-operated, they certainly are not one of the best. To cope with possible future needs and expansions, new housing areas are much needed. Better living environments and higher quality of student life should be considered at the same time.

2. Off-campus apartments

In planning a new housing complex, knowledge of privately owned, off-campus apartments is also needed. My interviews and surveys indicate that R.I.T. students prefer apartments that are closer to the school, and the most popular include the following: West Brook Commons, Rustic Village, Crittenden, and Riverton. Compared to the four, R.I.T.-owned apartments, these apartments have better overall quality. They include outdoor swimming pools, tennis courts, baseball parks, and other exercise facilities. All of these apartments are air-conditioned and provide better kitchen equipment such as dishwashers and garbage disposal. In addition, I also collected some floor plans and catalogs to be used as references to help in my designs.

3. Student housing in other colleges and universities

I also wanted to gather information about student housing in other colleges and universities that are similar to R.I.T. Due to limitation of funds and time, I only managed to get data from Memphis State University (M.S.U.) through the help of friends. M.S.U. is similar to R.I.T. in both size and student population. M.S.U.'s policy is to separate most graduate students from undergraduate students' housing areas, including dormitories and apartments. They even have a special housing area—the "Married Dorm"—reserved for married graduate students, which provides all basic furniture, including desks, chairs, bed frames,

closets, sofas, curtains, and telephones. Compared to R.I.T., they provide much better service for the students, not to mention the rent is much cheaper than R.I.T. apartments.

Other universities such as Washington University in Seattle provide a 5-bedroom apartment with refrigerators, a common kitchen and living room; University of Vermont has 1, 2, 3, and 4-bedroom apartments to choose from; Stanford University provides housing for unmarried graduate students with 2-bedroom and 4-bedroom apartments to choose from.

The above shows the consideration and planning for graduate students' housing needs by the other schools. These examples could be good choices for R.I.T. to consider.

C. Investigation of site conditions

When I first started my research, Scott Lawson of the Facilities Office of R.I.T. suggested a site, located at the north side of Perkins Road, for this project.(See Figure 2.) Though this site does not conform to the 1987 Master Plan, it is now suitable to be developed in advance because of its geographic conditions. Therefore, I accepted the proposed site.

From maps and documentation made available by the Facilities Office, I studied the following Site Factors:

1. surface: a) size
   b) geologic and land form
   c) hydrography
   d) vegetation
2. underground:
   a) soils
   b) water table
   c) utilities
3. climatic: a) temperature
   b) precipitation
   c) solar orientation
   d) wind orientation
4. traffic and transit
5. visual factors

According to the analysis of the R.I.T. Land Use Master Plan, Figure 3. shows the limitations on construction. The zones of varying limitations on building construction and associated development are determined by combined factors of soil structure, slope, and water conditions. The most important climatic factor regarding this project is the solar orientation. I thought it would effect the orientation of the building most since other conditions are the same as the current housing complex. Figure 4. shows the

solar orientation and area land use. Figure 5. shows the site from different angles.

D. Requirements of Building and Zoning Codes

The New York State Uniform Fire Prevention and Building Code and the Zoning Code of Henrietta are legal references that I have to observe. In regard to the design, Zoning Codes would determine the following:

- The percentage of lot occupied by buildings shall not exceed 25%.
- The distance between buildings shall not be closer than 40 feet.
- A one-bedroom dwelling shall not be less than 600 square feet, and a two-bedroom dwelling unit shall not be less than 800 square feet.
- The area required for parking one automobile is held to be an area 10 feet wide and 20 feet long, not including passageway; the quantity of parking spaces requires 2.5 cars per unit.

In regards to the Building Codes, I determined each multiple unit apartment should be accessible for the handicapped, and requires two entrances with double doors, one elevator, two firestairs, laundry rooms, more expensive fire-retardant construction, and greater load bearing capacity of the soil. Two-story buildings should have at least one dwelling unit but not less than 25% of the total number of dwelling units adaptable for the handicapped.

E. Other

In addition, I considered sports facilities—tennis courts, basketball courts, beach volleyball courts, and swimming pools; parking lots—parking method and the smallest sizes allowed; etc. All these were needed in designing my site plan. Other important considerations are the materials used for the interior of the buildings, and exterior materials sensitive to the context of the existing campus.

III. Development of the Program

A. Limitations

B. Establish goals and objectives

C. Programming

A. Limitations

The mid-range plan for R.I.T. has already reached its expected development, but there are no confirming proposals or plans for the long-range plan. In other words, the current Long Range Master Plan is just a suggestion, or a general instruction. R.I.T. has no specific plans for additional housing construction at this time. A project such as I had in mind would have to be directed by the Administration and Trustees of the Institute.

As an academic proposal, therefore, I relied on my initial observation of a need for separate housing for mature, married, and graduate students; and on my data collected from eligible tenants of that housing.

My goals for the quality of that housing were tempered by those of the Facilities Office and those of the Apartments Management. It was determined that, to be practical, the project would be of moderate density, and be designed to be suitable for the site suggested.

B. Establish goals and objectives

To sum up the analysis from Chapter II, and in consideration of my own hypothesis, I developed three main goals and various objectives that this project should achieve and they are described as below:

1. Goals:

    a) To design a housing complex for both single and married graduate students, to function as a comfortable home, a supportive facility for serious academic work, and an active community for social interaction.

    b) To strive for maximum privacy of units, while encouraging a sense of community.

    c) To provide form and style of the buildings and their interior design and provide "softening and introduction of more human scale elements."[6]

2. Objectives:

    a) To define, in this community, clear public and private areas with semi-privacy areas as a buffering space.

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[6]Glavin and Van Iderstine, RIT land use study update, February 1987, (Syracuse, New York: Glavin and Van Iderstine landscape Architects, 1987), 40.

b) To supply some common areas, and convenient and fully-equipped public facilities to complement the college housing complex.

c) To seriously consider the real needs of the users, and to create a human scale community, which is compatible with the overall architectural vocabulary existing at R.I.T.

d) To arrange convenient and attractive pedestrian and vehicular circulation throughout the housing complex.

e) To conserve and enhance the natural environment.

f) To design a barrier-free environment for convenience of handicapped persons.

g) To provide each building or cluster with its own identity.

h) To provide each student with an equal, appropriate, and equitable space allotment.

C. Programming

Based on my research of similar facilities, interviews with Facilities Office and Apartment Management, and results from my questionnaire, I developed the program of this housing complex as follows:

1. Land use:

   The site is approximately 15 acres; approximately 550 feet from Perkins road running from north to south, and approximately 1,500 feet long opposite the Perkins Green housing complex between John Street to Andrews Memorial Drive.

2. Density: Approximately 8-10 units per acre

3. Housing:
   a) Four-bedroom Townhouse / Apartment: about 25 units
   b) Two-bedroom Townhouse / Apartment: about 90 units
   c) One-bedroom Apartment: about 30 units
4. Service facilities:
   a) Parking for 2.5 cars per unit
   b) Refuse disposal and recycling accommodations
   c) Laundry and vending facilities
   d) Mailbox and intercom
   e) Rental office and management office
   f) Storage
   g) Maintenance garage

4. Socializing and recreation:
    a) Common room
    b) Exercise facilities–tennis courts
    c) Passive outdoor recreation space
    e) Children's play space

5. Study facilities:
    a) Quiet space
    b) Computer user center

6. Commercial area: *
    a) Restaurant
    b) Convenience store

*The reason for including a restaurant and a convenience store within the new housing complex is based on students' wants and needs, since there are many resident students in this major residence area. The total number of potential customers include all the residents in Colony Manor, Perkins Green I and II, and the proposed Perkins Green III, numbering to over 520 apartment units, not to mention all the students living in the nearby dormitories. The restaurant would be able to provide a flexible choice in foods, and convenient proximity.

While I have reserved space for commercial development of the restaurant and convenience stores, their design is beyond the scope of this project.

IV. Design Concept

A. My design concept

B. Design development

"Designing is a rational creative activity, thus creating an environment can also be called environmental designing."[7]

In this context, environment means human beings' living space, from activity environments in large urban scale to small personal interior space. To have a unique personality, a design must have its special characteristics and distinctive features.

A. My design concept

A student housing complex must relate to the school's existing style and design. R.I.T.'s features of "strong geometric architecture"[8], "a fortress", and "a stark brick architecture"[9] already limits the style and form when a new housing complex is to be built. But this limitation became an asset and gave me a general direction for my design. As a result I had to find a balance between the existing design and my own concept.

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[7]Pinjyh Ho, Modern Interior Design (Taipei, Taiwan: Continental Books, Inc., 1986), 34.

[8]Thomas Againes, The Campus as a Work of Art (New York: Praeger Publishers, Inc., 1991), 73.

[9]Glavin and Van Iderstine, 35.

Reflecting back on my primary attitude—design for people, no matter from what point of view—urban planning, architecture design, or interior design are all bound by one important principle because they were all created for human use. All have meanings and values when their art is perceived by mankind.

At the same time, "designing is a process of problem solving"[10], I must first consider the function and the user's habits, and then, considering the visual impact, the form would emerge in its own style.

B. Design development

R.I.T.'s buildings give me and many others the feeling of being heavy and massive. My idea was to divide and yet link the new buildings, so that they will respect the existing geometric and volumetric character, but have rhythm with the existing vocabulary for the purpose of being softer and more visually pleasing.

To humans, walls can give a sense of safety. To satisfy this need for safety we surround ourselves with walls. R.I.T. represents a castle or fortress; I attempted to recall this concept by making a wall of the housing which defined exterior space for students.

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[10]Kuang Ting Wu, "Design for People and Landscape Architecture," Arch monthly, 25 January 1991, 81.

1. Site development

   a) Figure 6. shows my preliminary concept of the site plan consisting of several two-story apartment clusters connected together in order to form a large wall on all sides and a broad street space. But this creates many problems since people and vehicles are mixed together in the same area. Open spaces become separated, and my design purpose is diluted.

   b) My revisions are shown in Figure 7. Instead of some two-story apartments with a mid-rise apartment, I left more open space. Similarly, this arrangement lacks unique characteristics because the mid-rise apartment looks incompatible with other buildings and the primary concept is even more vague.

   c) Finally, the site plan evolved into Figure 8. I developed another mid-rise apartment and aligned them at the south side. Streets and parking space surround the apartments, while the apartments, symbolizing walls, surround the central courtyard. The larger scale apartments buffer the smaller scale townhouses from traffic and traffic noise.

2. Building development

In developing the buildings, my original plans consisted of mostly two-story apartments to lower the cost of building. I developed one-bedroom and two-bedroom apartments as a two-story apartment cluster, and four-bedroom townhouses. (See Figure 9. and Figure 10.) To save space, to decrease housing density, and to consider the accessibility for the disabled, I developed alternative four-bedroom mid-rise apartments, one-and two-bedroom mid-rise apartments, and two-story two-bedroom townhouses. The mid-rise apartments are planned for most single students and with elevators that meet the requirements of the **Americans with Disabilities Act**.

In organizing interior space, I borrowed the concepts of **Subtraction**, **Multiplication**, and **Division** from mathematics, but applied them as architectural vocabularies. Usually, a designer develops space by adding or combining different spaces together to create his ideal design. My idea of subtraction is to define a space by reducing or removing parts of a larger space or its volume.

In designing the floor plan of the four-story apartments, I created a typical four-bedroom apartment then duplicated each one four times. The lobby, elevator, and other public areas were located in the middle of the apartments. When I developed more details, I found this sketch ordinary and boring. I then removed one unit from each side, and turned one side of the floor plan upside down in order to connect them. Thus the plan became a form consisting of two squares overlapping at one corner. This arrangement

took advantage of the area that I removed to house the public areas—lobby, elevator, laundry room, rental office, and others. This area also provided enough space to develop into entrances and vestibules with a glass roof. Eventually, the apartments were developed as a dumbbell shape, thus each unit has similar physical conditions. The application of the subtraction method was removing two units from the original scheme; of the multiplication was duplicating the typical unit; and of the division was dividing the building into two wings.

The two-bedroom townhouse is developed for the student who is accompanied by his spouse and possibly children. Since the typical student's family consists of three family members—the student, his wife, and the first child, I designed the two-bedroom townhouse, instead of the current three-bedroom townhouse, so that they don't have to pay more rent for unneeded space or share the apartment with others.

In designing the floor plan of the two-bedroom townhouses, I also applied the same skills. On the second floor, I reduced the size of the study room to the minimum. In the living room, since the area was small, I extended the space up to the roof to visually enlarge the space without using additional area. In this way I used economical methods to maximize the feeling of space.

The exterior of the apartments relates to R.I.T.'s geometric expression of brick walls. Elements of Chinese gardens—"wavy cloud walls" and

"hole gates"—are useful architectural vocabularies here. The wavy shape of the top of the "Wavy Cloud Wall" can soften the feeling of an ordinary wall's hardness, coldness, and confinement. Furthermore, it can create visual interest and also keep the function of walls. The "Hole Gate" is the opening in a wall to frame a particular scene and continue the circulation on both sides of the wall. The two-story, two-bedroom townhouse arrangements represent this kind of wall but articulate each unit to create identity and a smaller residential scale.

V. Final Design Description

A. Site plan

B. Four-bedroom apartment

C. One and two-bedroom apartments

D. Two-bedroom townhouse

After multiple modifications, I finally achieved the final design of one four-story building consisting of four-bedroom apartments; two four-story buildings consisting of one- and two-bedroom apartments; and six clusters of two-bedroom townhouses totaling 40 units. The combined apartments and townhouses total 144 units or 304 bedrooms. In addition, laundry rooms, a playground, a students' maintenance garage, off-street parking, refuse disposal, a rental office, a computer user center, and other service facilities were also necessary. The description will progress from site plan, four-bedroom apartment, one and two-bedroom apartments, then to two-bedroom townhouses.

A. Site plan

This housing complex—temporarily named Perkins Green III—occupies roughly 15.15 acres. The total area including the area reserved for the restaurant and convenience store is about 18.66 acres. The percentage of the lot occupied by buildings is 11%, and the density of the complex is 9.5 units per acre. (See Figure 11.)

There are two main entrances to this housing complex, on the east and west ends from Perkins Road. Two secondary entrances are located between the two main entrances and serve as entrances to the parking lots. The driveway within the complex forms a complete circle except the entrances to the two-story townhouses form S-shapes to reduce vehicle speed. In addition, speed bumps will be built to further reduce vehicle speed and to increase safety for residents.

The right side of the east main entrance is the parking lot reserved for visitor parking; the student maintenance garage is located at the south-east corner of the parking lot, it provides a suitable space for students for basic maintenance of their vehicles during bad weather. Three tennis courts, running north to south so that the players have to face neither sunrise nor sunset, are next to the student maintenance garage.

Three mid-rise apartments are located at the south of the site. These apartments, along with their parking lots and the original row of trees, separate the noise of the through traffic on Perkins Road from the rest of the complex, thus increasing the privacy of the complex. The three mid-rise apartments are not laid out in a straight row due to differences in contour lines and the element of rhythm. The four-bedroom apartments are located in the middle of them. Both the rental office and computer center are located within this building and are within walking distance from all residents of the entire complex.

The six clusters of two-bedroom townhouses are arranged in staggered fashion along the west, north, and east sides of the site, forming a circle with the three mid-rise apartments. This arrangement defines a passive exterior space but does not seal the area off. Thus the complex is easily accessible and provides psychological security for the residents. At the same time, three mid-rise apartments located near the exits further enhance the feeling of safety by providing visible activity and visibility on the exterior space.

The open space surrounded by the apartments can be roughly divided into three areas—pond, playground, and courtyard—strung together by a diagonal brick pavement. Two mid-sized outdoor sculptures are arranged at appropriate places at both ends of the straight walk way and provide different views when taking a walk along this pavement. The playground is located in the middle of the courtyard beside the small hill on the north side. The pond, formed by two different sized circles, is located at the west end of the brick pavement.

Two-bedroom townhouses are grouped into east and west groups, and each side has a small laundry room. This arrangement minimizes the distance between the residence to the laundry room. The mid-rise apartments have laundry rooms within each building.

B. Four-bedroom apartment

The four-bedroom apartments are housed in four stories with six units per story. This building is formed from a rectangular shape divided by a 45° axis into two L-shaped wings. The two L-shaped wings are then joined together by a structure consisting of the entrance, vestibule, lobby, rental office, laundry, common room, computer center, elevator, corridor, and firestairs.(See Figure 12. 13. 14. 15.) The vestibule is designed with Rochester's long snow season in mind and provides maximum sunlight from a glass roof slanting from the fourth floor to the entrance at two stories high. (See Figure 16.) The rental office and laundry rooms are located at both sides of the lobby. Firestairs are located to the left and right with the exits reversed. On the second floor, the common room is located just next to the elevator. The computer center is placed at the right side, and there are men's and women's restrooms at one end. (See Figure 14.) The elevator and indoor terrace are semi-public areas located on the third floor of this connecting structure. To provide sunlight and freedom from the snow and cold outside, and to provide a place to socialize is the purpose of the indoor terraces. The third and fourth floor have S-shaped corridors to provide additional privacy for both sides of the apartment units.(See Figure 15.)

The floor plan is identical for all units, and each unit is about 1338 square feet in area. (See Figure 17.) Each unit has two bathrooms which are equipped with ivory colored mosaic and bath fixtures. One of the bathrooms has a wheelchair accessible, walk-in shower. Each bedroom is approximately 132-138 square feet and provides basic furniture such as a

desk, a wood chair, a bed stand, and a wardrobe with drawers. The kitchen provides a disposal and dishwasher in addition to the basic appliances such as refrigerator, oven, vent, and cabinets. The living room is furnished with a television/video cabinet. The furniture eliminates the need for students to provide their own furniture.

The exterior elevations show the use of brick, which matches the rest of the campus, accompanied by yellow imitation stone tile. (See Figure 18. 19.) The complex looks similar to R.I.T.'s buildings, but would be more decorative.

C. One and two-bedroom apartments

There are two four-story buildings consisting of one and two-bedroom apartments in this complex, with basic structures identical to the four-bedroom apartment, except that laundry rooms and mechanical rooms can be found on every floor, and that no public services are provided for outsiders. Most of the public areas and corridors are lit by natural lighting to save on electricity and to provide a symbol of division between public and private areas.(See Figure 20.)

In designing the typical unit floor plan I've created one type of one-bedroom apartment and two types of two-bedroom apartments. Each side of the building has two one-bedroom apartments, each occupying 728 square feet, and three two-bedroom apartments, each occupying approximately 980-1010 square feet. The rooms are integrated into the beam-column structure. As for the floor plan arrangements, the kitchens will have light green veneer cabinets, and white floor tiles and walls. The rest of the room will have light violet carpet to give the feeling of a warm and clean atmosphere. The ceiling height changes to define the dining-kitchen area from living room. The ceiling is designed as a curved line in order to obliterate some of its sharpness. The corridors will have Prussian blue carpet to show elegance and neatness.

Exterior walls and the firestairs recall existing R.I.T. buildings (see Figure 21.) and the two-bedroom houses. The main entrance differs slightly

from the four-bedroom apartment building with lattice casement windows extending to the two sash doors, showing order and regularity.

D. Two-bedroom townhouse

The two-bedroom townhouse was designed mainly for married graduate students who may have families. Each unit is about 1,110 square feet. (See Figure 22. 23.)

The front entrance includes a tiled floor, a closet with wood sliding doors and access to the stairs to the second floor. The living room adjoins the vestibule. The small living room has a ceiling opened to the roof to visually expand the space. Tadao Ando, a well known Japanese architect, said "The parts define the whole and the wholes prescribe the parts.....".[11] The small living room has its own special character. The window treatment is one of visual focus. Lattice glass blocks with two casement windows at each side are the primary light source in the living room. This treatment can provide a lot of natural lighting from outdoors, but still provide privacy.

The dining area is separated by a curved ceiling from the living area; this curved line extends from the curved wall that surrounds a powder room. For visual purposes, the kitchen is combined with the dining area, making the small dining area and kitchen look wider than they actually are. The white floor tiles and the breakfast table define their functions. A storage room located adjoining the kitchen houses the heater and hot water tank. This area can also house one washer and one dryer if the students have their own machines.

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[11]Tadao Ando and others, eds., Tadao Ando, The Yale Studio and Current Works (New York: Rizzoli International Publications, Inc., 1989), 108.

Adjoining the back door from the dining-kitchen area, is a terrace with a four and one-half feet high privacy fence for family barbecues, and parking children's bicycles and outdoor toys without destroying the nice view. This outdoor extension may also increase the quality from the other housing complex, because I insist on creating a pleasing visual scene and a good quality community.

There are four rooms—two bedrooms, one bathroom, and one study room on the second floor. With light, soft peach color carpet and cream white walls, the second floor is defined as the most private area and as a study and rest area. The study room is formed by an inclined roof with a skylight and a dormer window.(See Figure 25.) I created the study room so that a student may study there without disturbing other members of the household. This room can also be used as a guest room for occasional visitors who want to stay overnight.

The exterior finish(see Figure 26.) of this two-bedroom townhouse matches wall finishes of the mid-rise apartments. The wall by the front door is set back 8 feet and extends up to the roof ridge which is formed as an image of a flying wing. In the front elevation, the pitch of the roof, dormer window, skylight, and glass blocks coordinate with three flower beds. The cluster of townhouses creates a wall of a scale compatible with the campus. The offset of individual units, however, provides interest, rhythm, residential identity, and comfortable scale.

VI. Conclusion

Design should be the process and the result of the interaction of rational and emotional thought. Rationality must be primarily about the deductive logic of knowledge, craft, and information; and transform itself into a concrete image. Emotion is primarily the arousal of imagination and creativity, and the feeling of human spirit.

"What happens in the classroom is one part of college education, but what happens after class can be just as important."[12] There are already a number of student apartments at R.I.T. My goal was to create units of better quality. Though **Perkins Green III**, the married and graduate student housing complex, does not completely meet the Institute's need for quantity of housing, it represents my good faith effort. I believe that "one's beliefs, when working on a design, are intensely held; one wants to make the statement as intense as possible so that it is clear and understandable."[13] I have considered the situation and adjusted my site plan to practical ends. I also reserved space for a restaurant and a convenience store. These space alternatives may provide a topic for further development.

In the process of designing this project, I learned more from my thesis committee than I used to know, and I realized that "The process of

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[12]Rochester Institute of Technology, Office of Admissions, R.I.T., Prospectus (Rochester, New York: Rochester Institute of Technology, 1991), 15.

[13]Ludwin Glaeser, Kevin Roche , Architecture and Urbanism (Tokyo: a+u Publishing Co., Ltd, 1987), 10.

realization is less a matter of dictates than of guidance."[14] Kevin Roche described in an interview: "...what you end up doing is just guiding a building through the forces which form it. ...You don't personally form the whole thing ...you're simply providing a certain amount of direction."[15]

Through this thesis project, I experienced that landscape, architecture, and interior design are almost the same thing but with different ornaments and scale. I also feel that interior design should permit more personal and intense character reinforced by the users. I trust my reasons are expressed by this thesis project.

Completing this thesis project is not an end, because I am now well prepared to begin my foreseeable design career. I would like to use the words of **Rainer Maria Rilke** to end this report:

"Living as I do at the turning point of a century.
I have the feeling that a new page is being turned."

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[14]Ibid., 12.
[15]Ibid., 12.

Figure 1. **Planning Flow Chart**

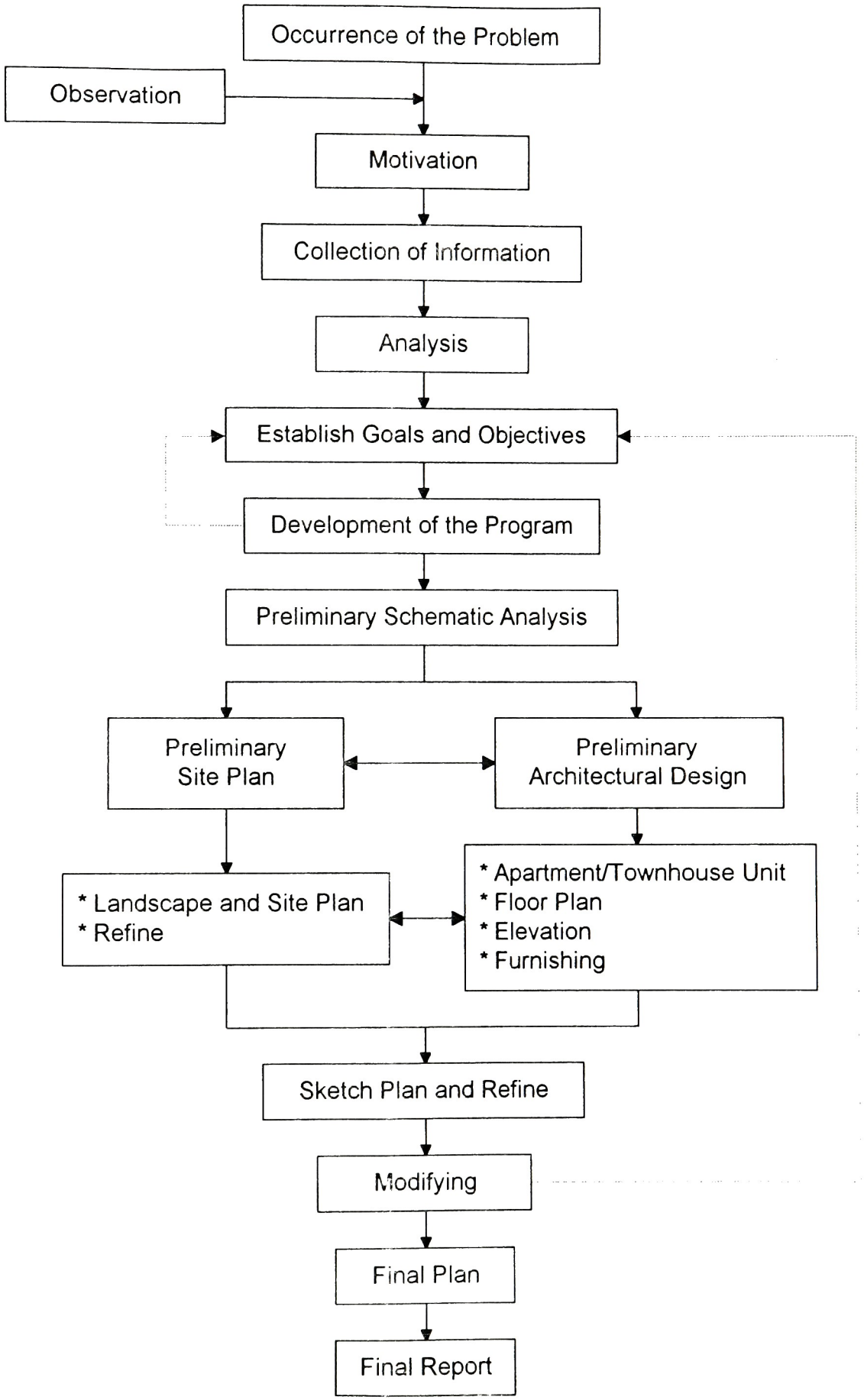

Figure 2. Key plan

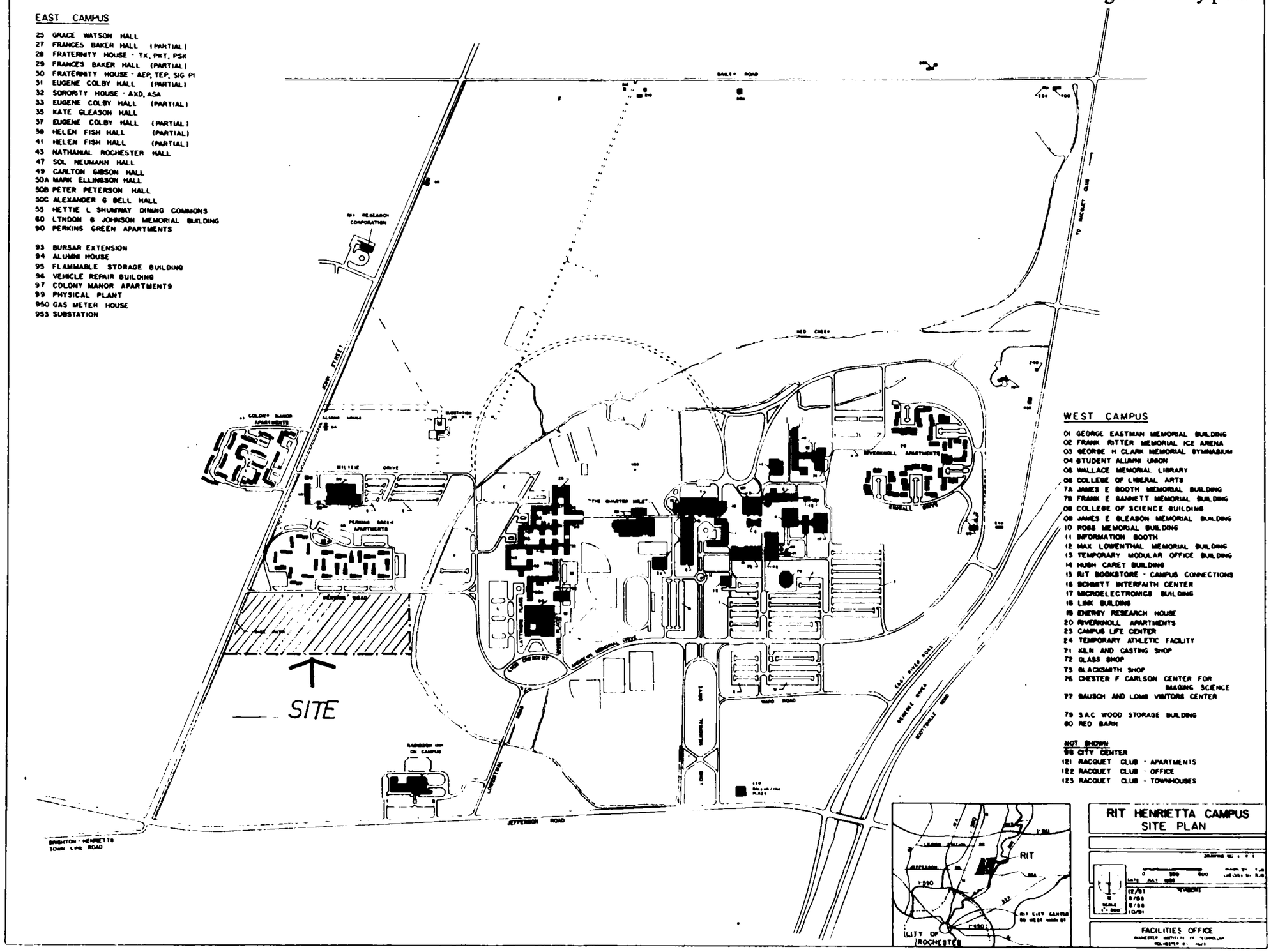

Figure 5. Different views from the site

Figure 5. Different views from the site (continued)

Figure 6. Preliminary site plan I

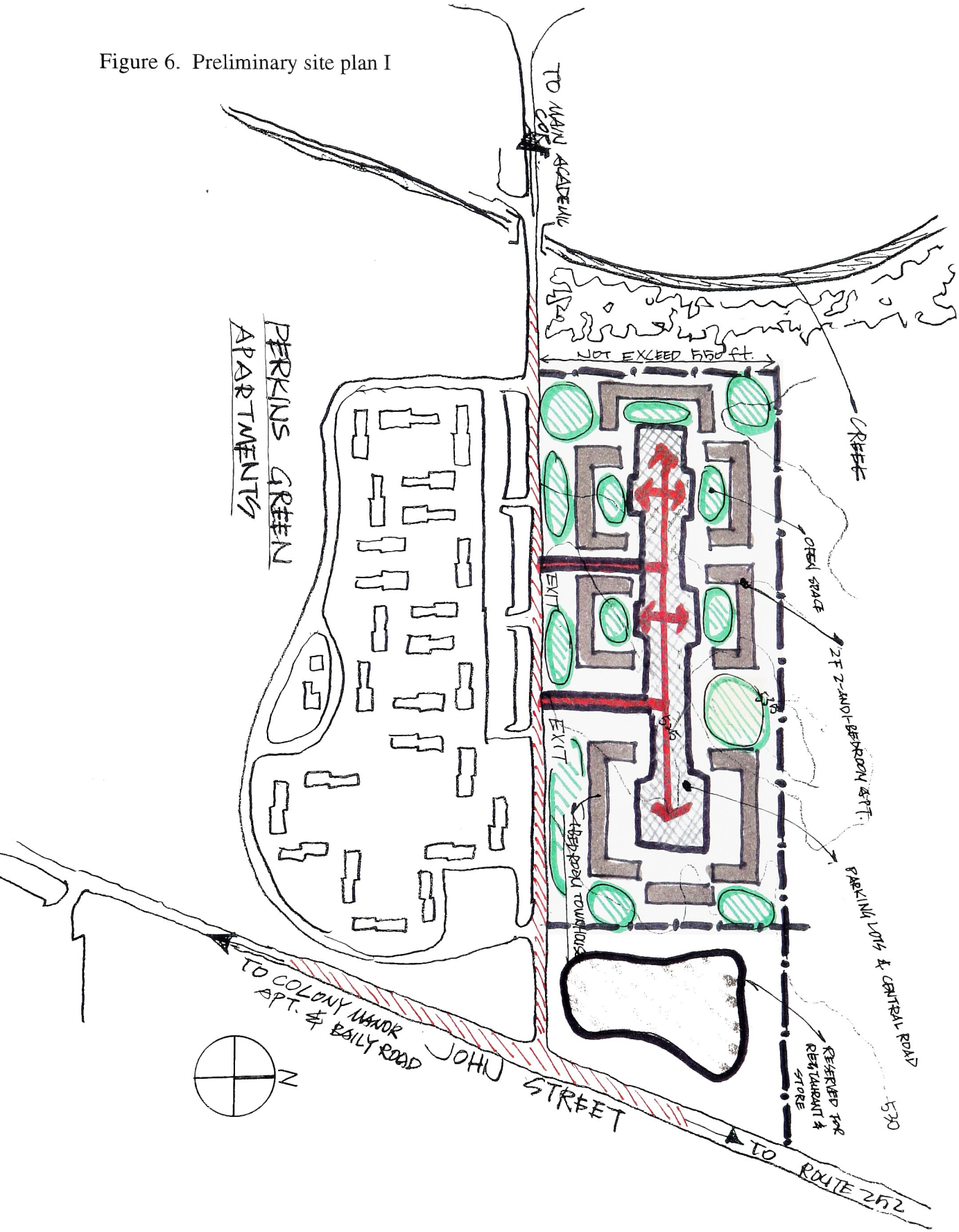

Figure 7. Preliminary site plan II

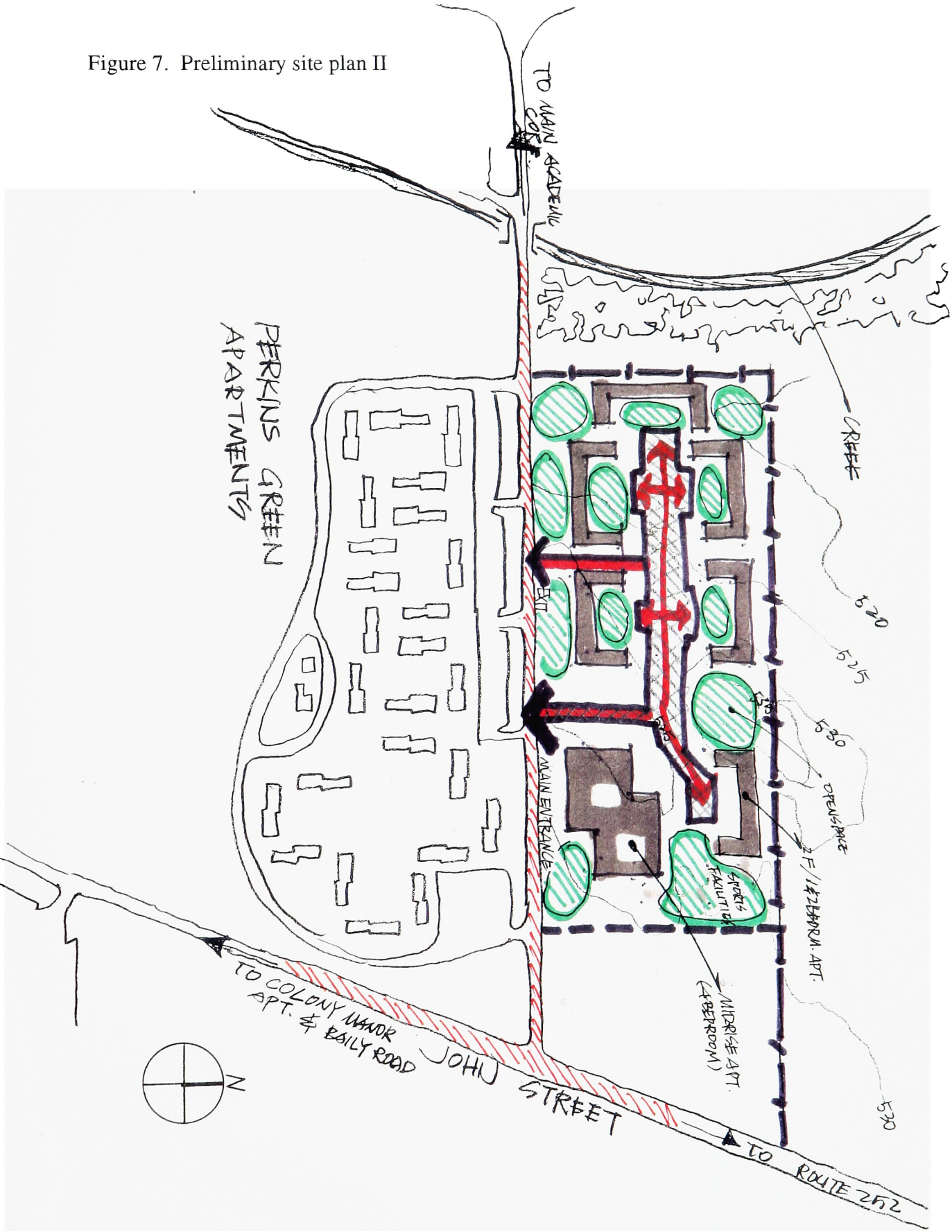

Figure 8. Preliminary site plan III

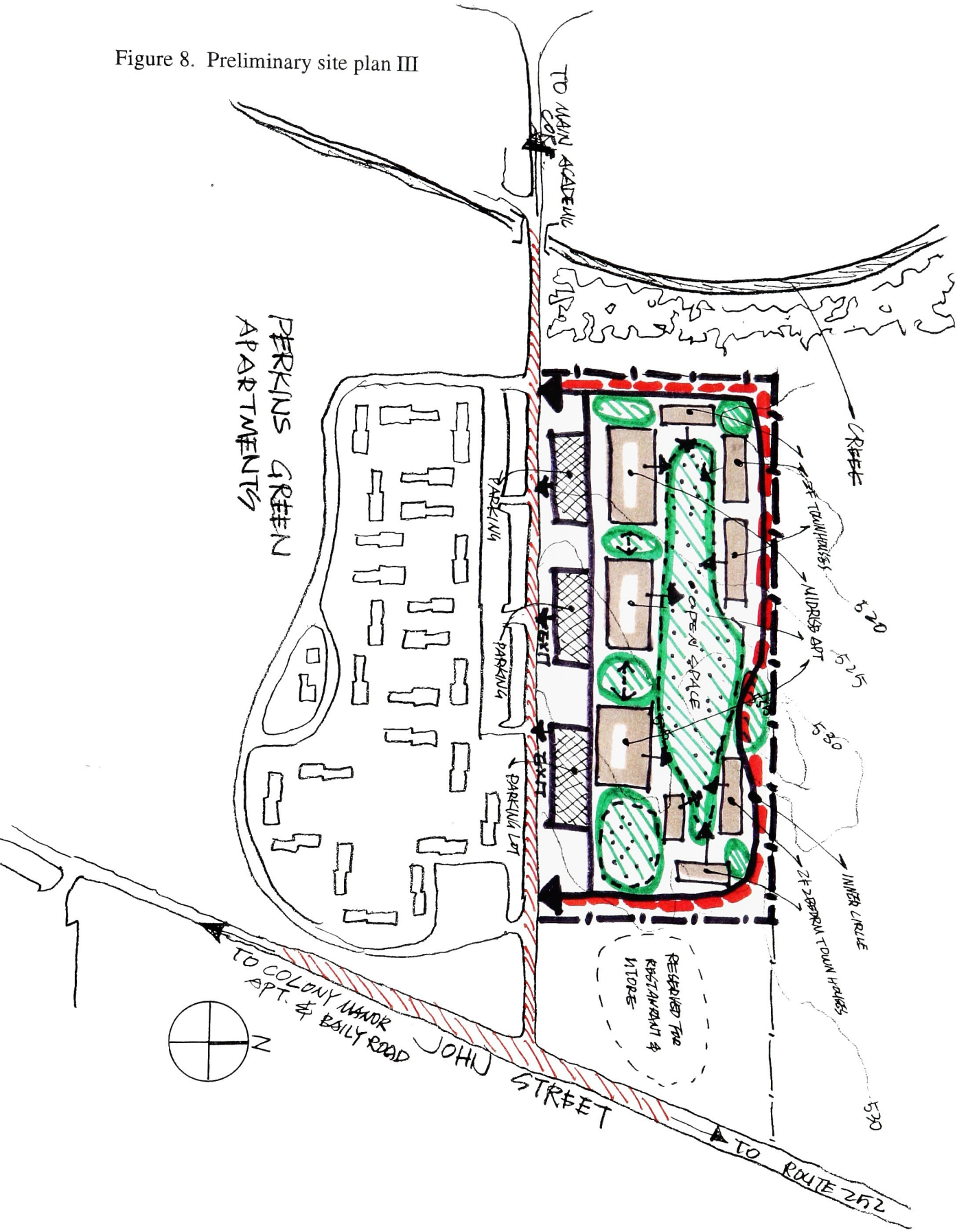

Figure 9. Preliminary floor plan of two-story apartments

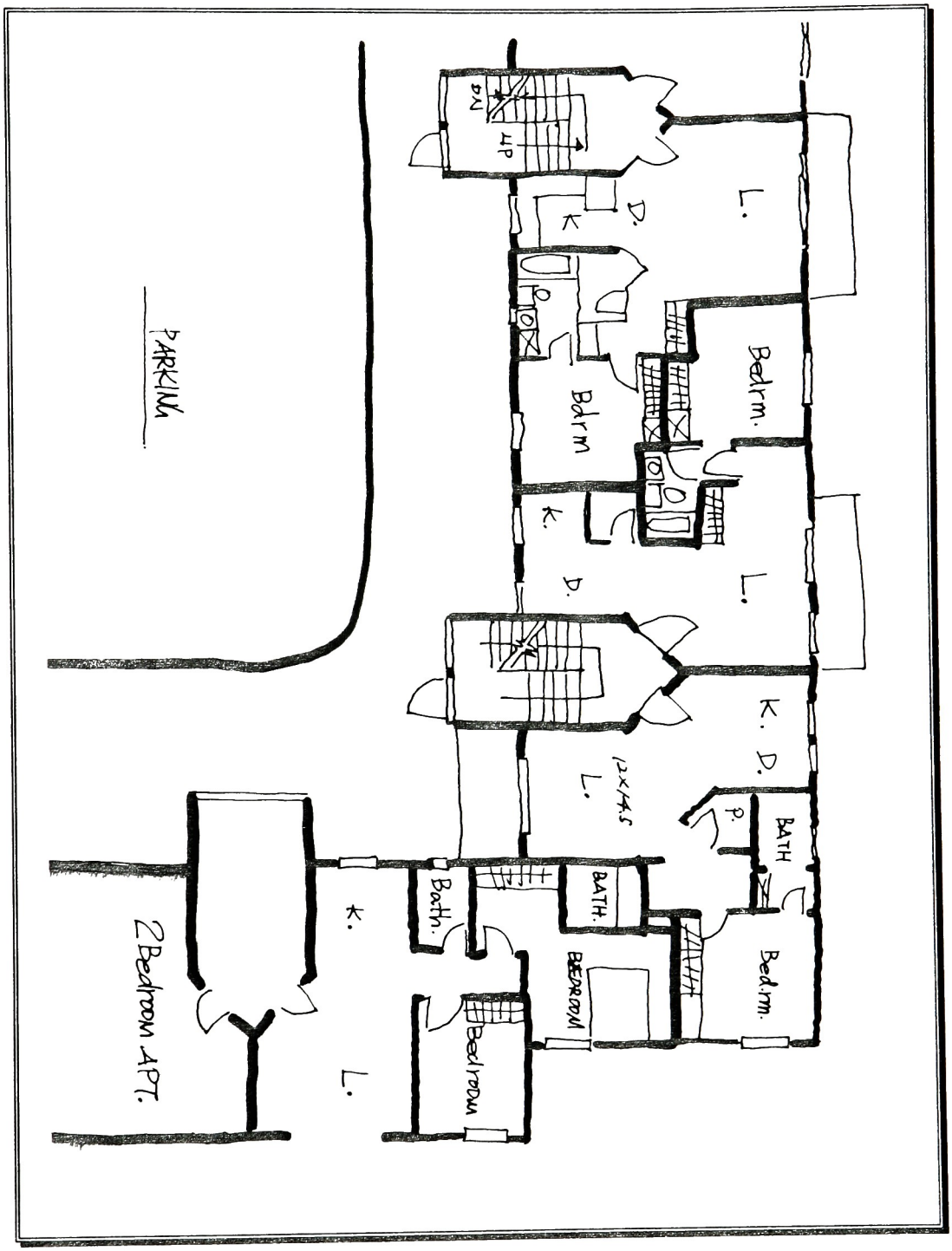

Figure 10. Preliminary floor plan of four-bedroom townhouse

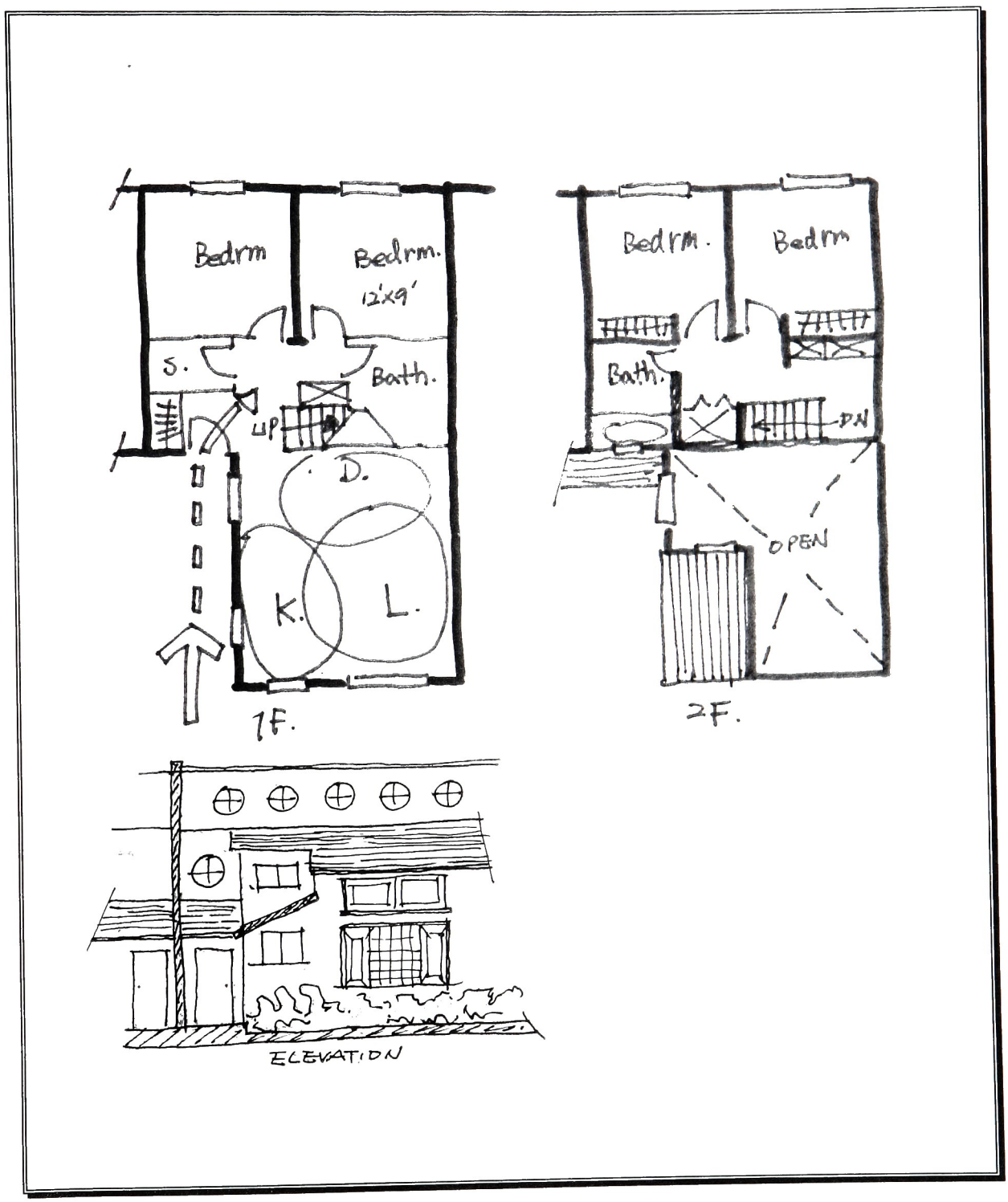

Figure 12. Floor plan of four-bedroom apartments

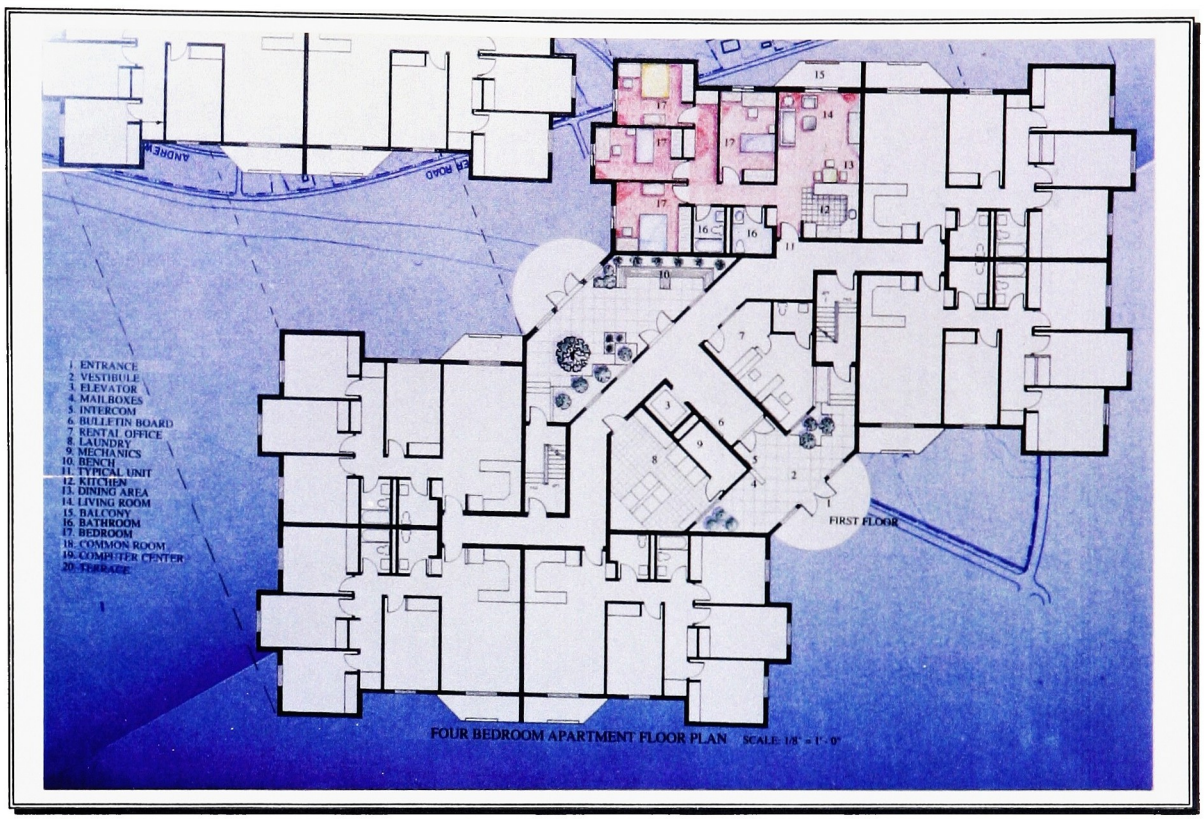

Figure 13. Floor plan of lobby

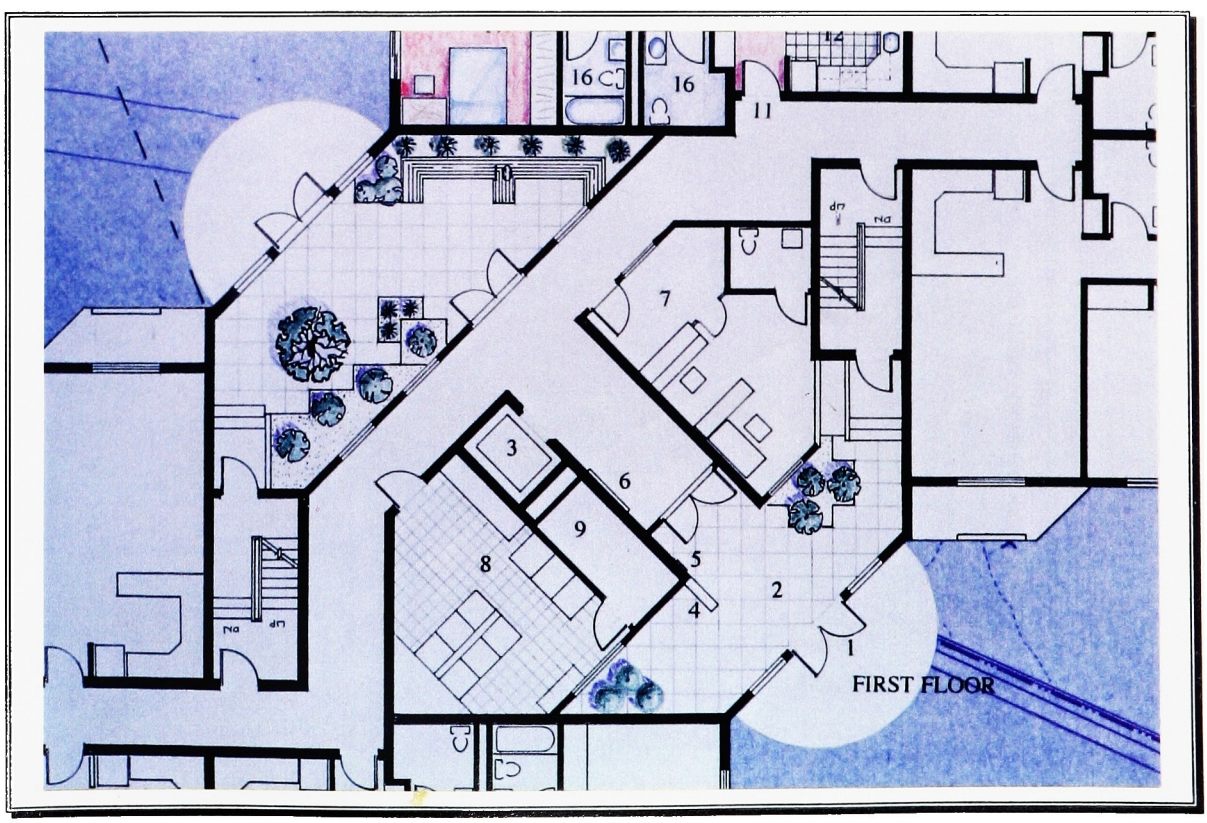

Figure 14. Floor plan of common room and computer center

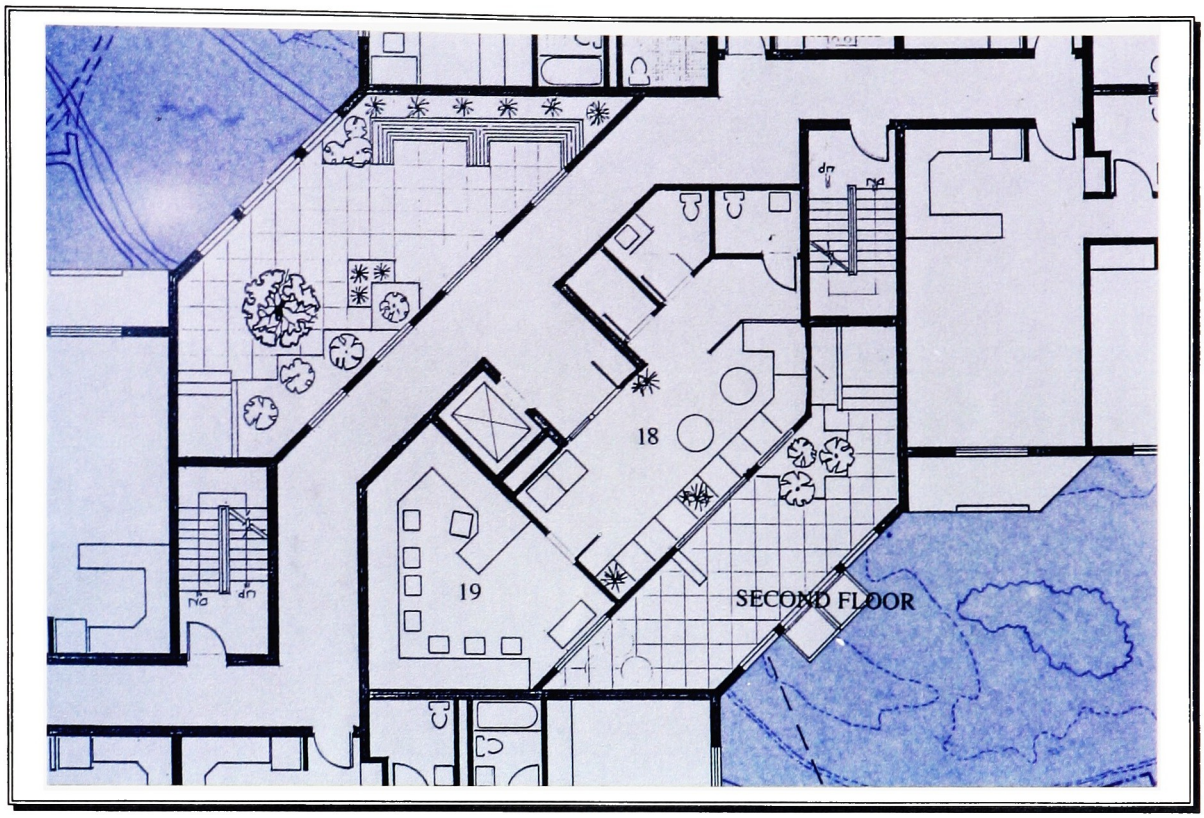

Figure 15. Floor plan of third and fourth corridors

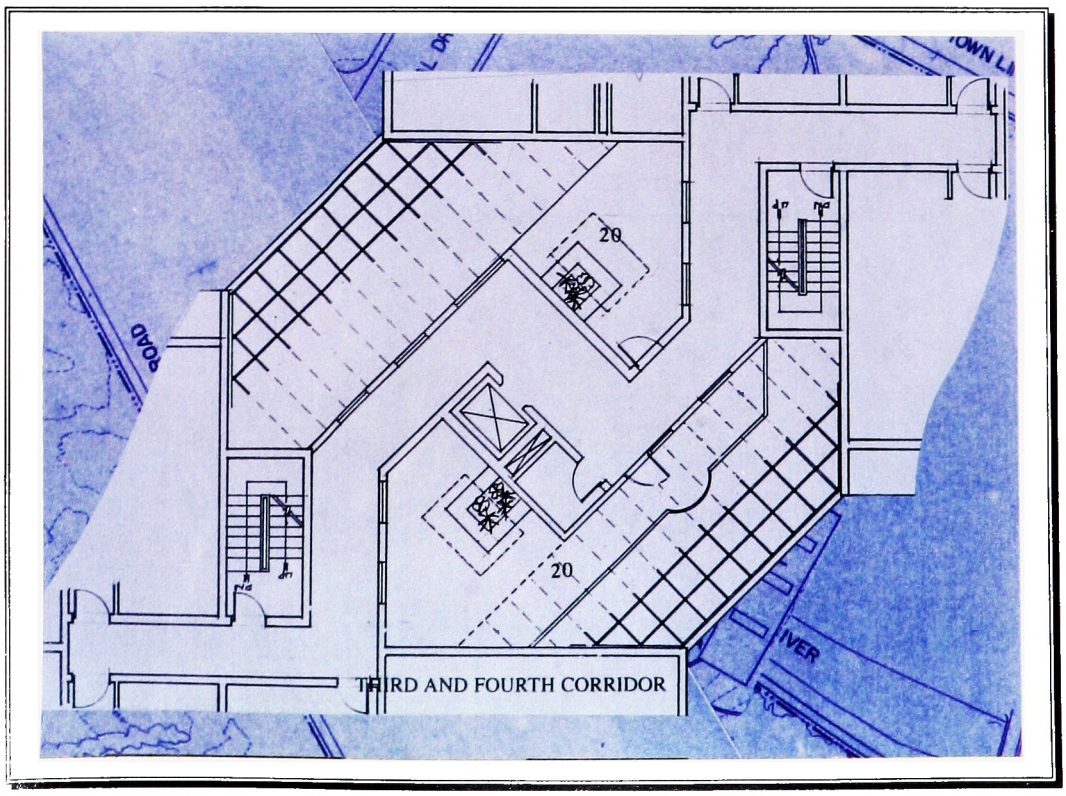

Figure 16. Perspective and section of vestibule

Figure 17. Typical floor plan of four-bedroom apartments

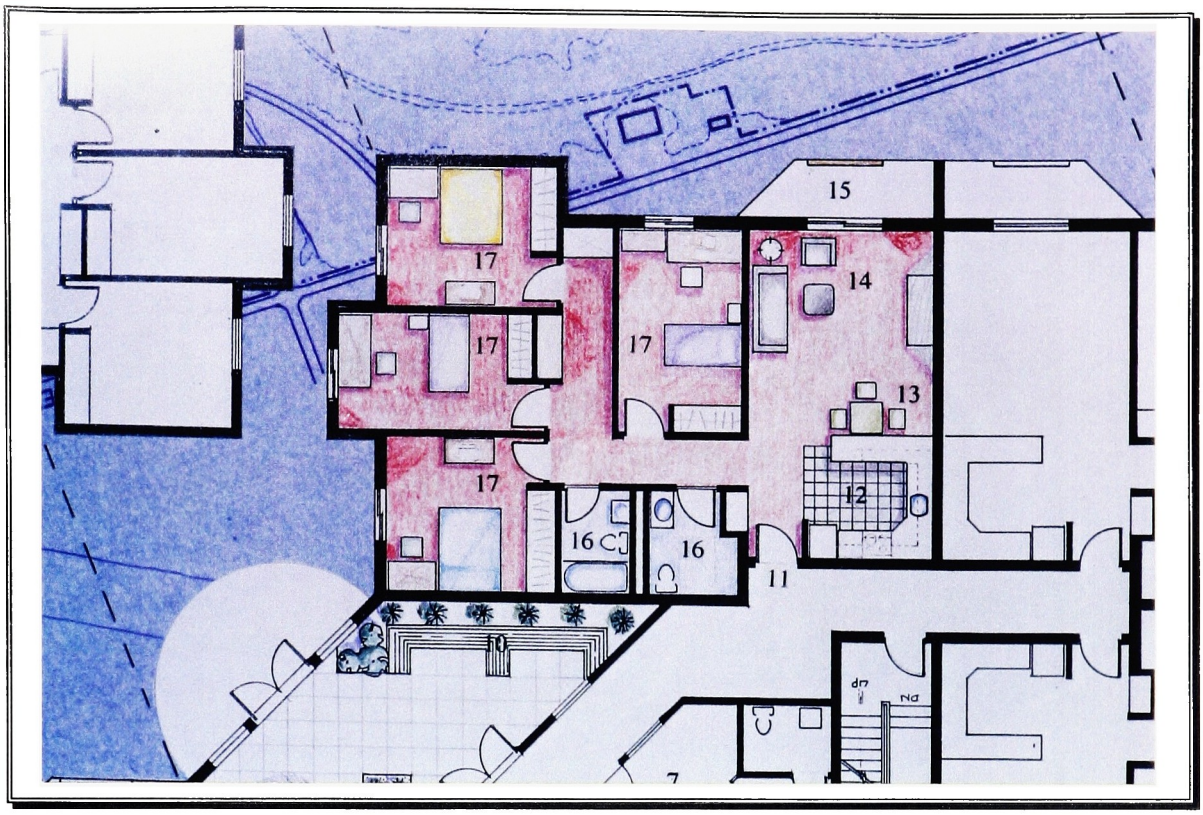

Figure 18. Elevations of four-bedroom apartments

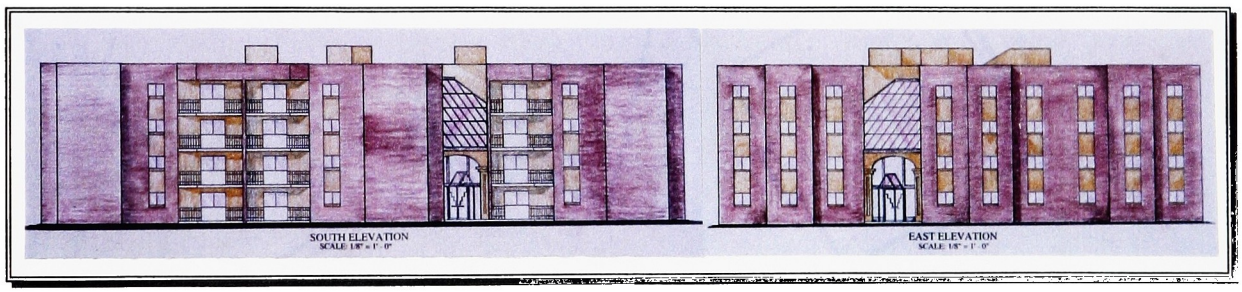

Figure 19. Perspective of four-bedroom apartments

Figure 20. Floor plan of one and two-bedroom apartments

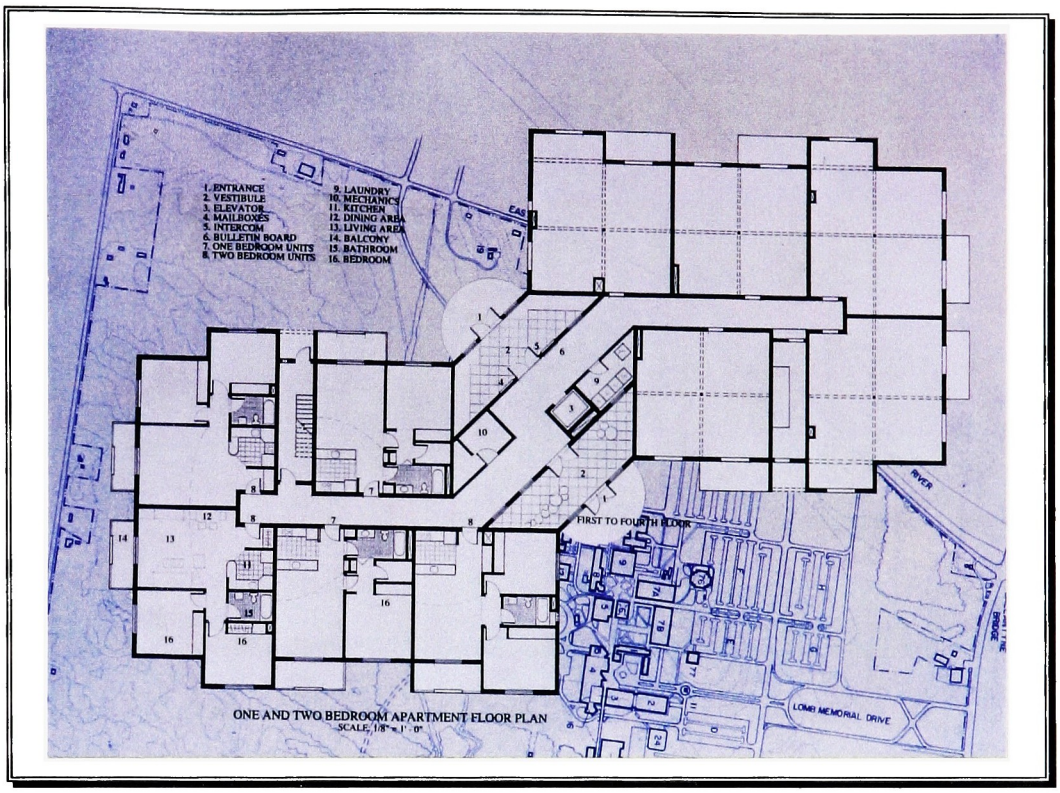

Figure 21. Elevations of one and two-bedroom apartments

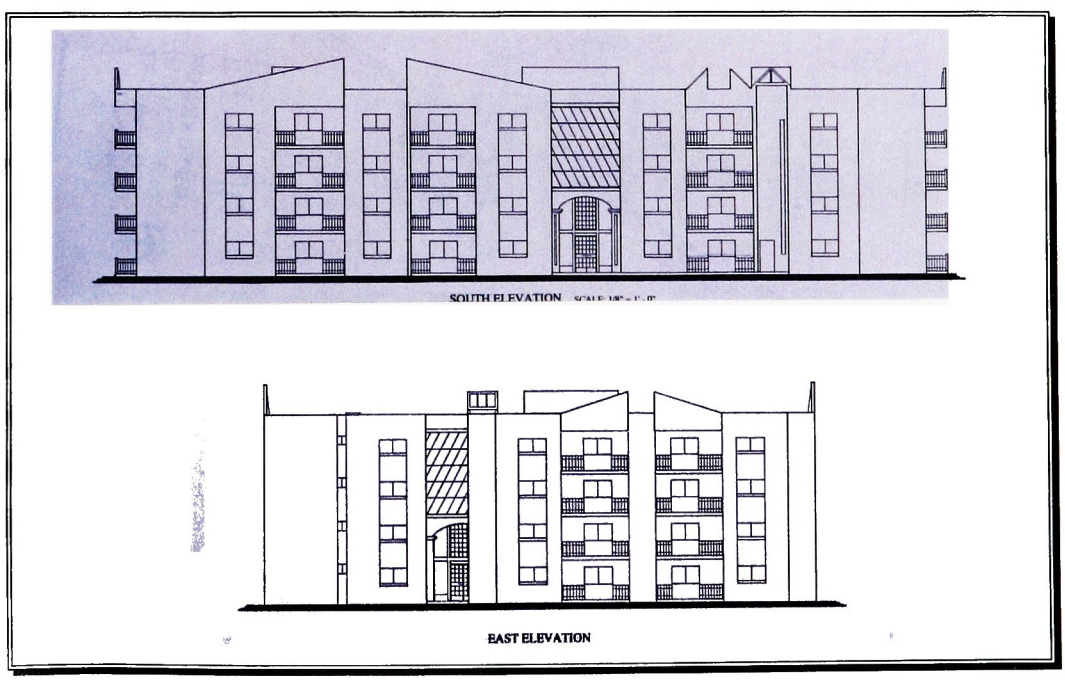

Figure 22. Floor plans of two-bedroom townhouses

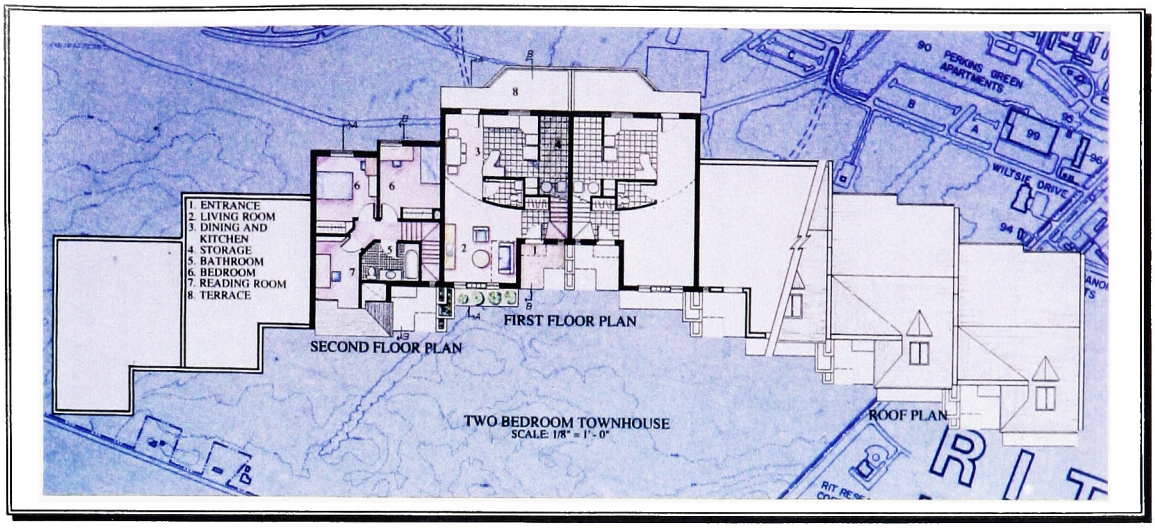

Figure 23. Typical floor plan of two bed-room townhouses

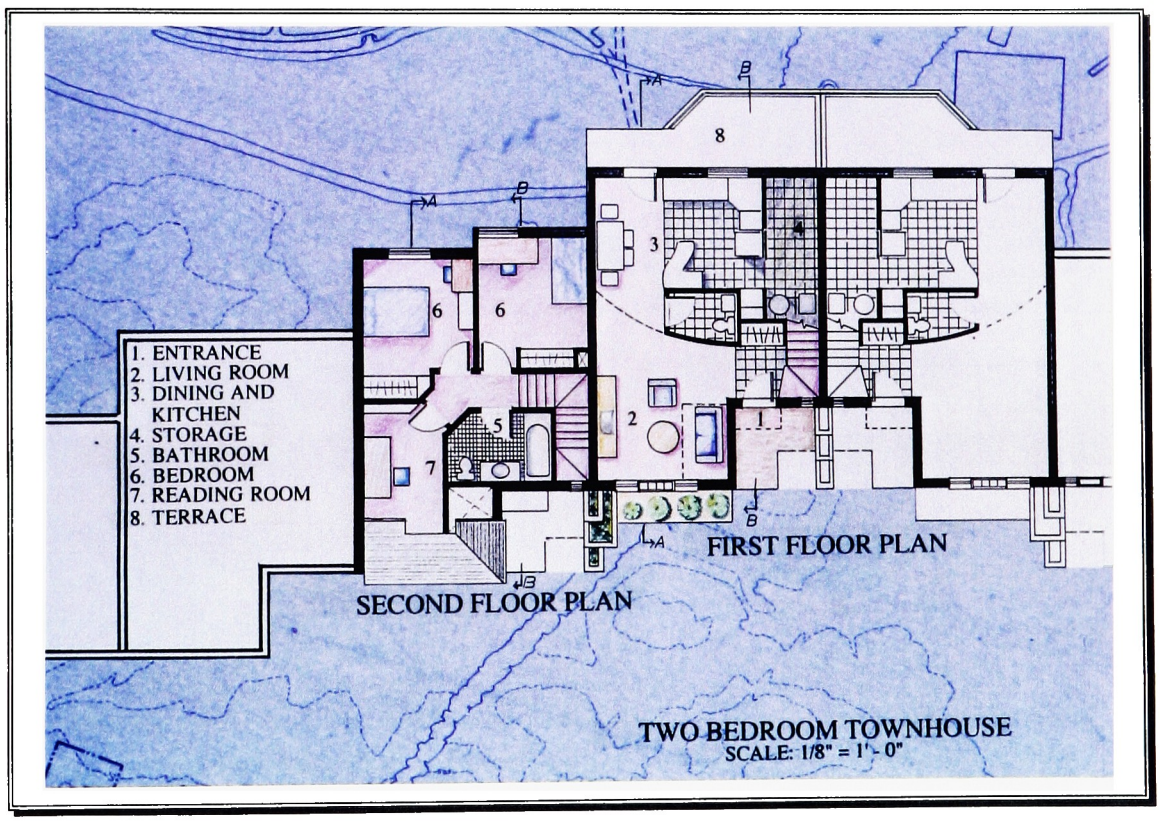

Figure 24. Perspective of living-dining area of a two-bedroom townhouse

Figure 25. Sections of a two-bedroom townhouse

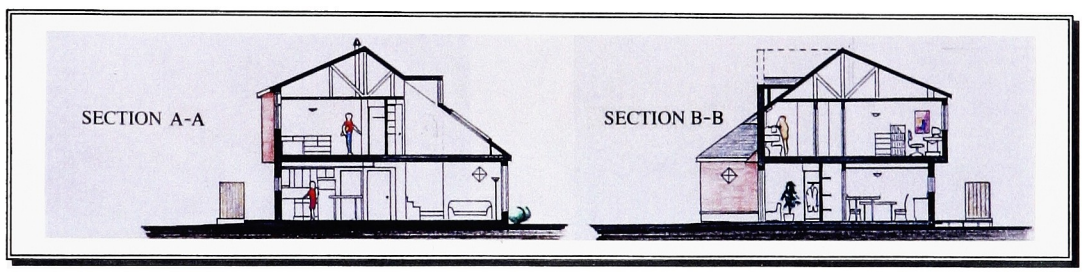

Figure 26. Exterior elevations and perspective of two-bedroom townhouses

Appendix

This questionnaire is prepared for an investigation of students' opinions about RIT student housing for my master's thesis for the Department of Interior design.
I 'd like to thank you for spending a few minutes to read and complete the following questions.

Chou-Tein Lin

==========

1. What is your major and year level?

2. Do you think the rental fee of your apartment is reasonable compared with other off-campus apartments?

3. If there were a cafeteria or restaurant around your resident complex, would you eat there? How often?

4. What kind of restaurant do you prefer? (e.g. Perkins, Ponderosa, Homestyle buffet, China buffet, fast food...)

5. If there were a convenience store (like 7-11 or Bi-rite) adjacent to your housing complex, would you purchase groceries there?

6. What kind of apartment is your first priority? (e.g. studio, 1-bedroom, 2-bedroom, 3-bedroom apartment or townhouse...)

7. If there were a housing complex that was reserved for graduate, married or other mature students only, would you like live there?

8. What if there were an apartment with 5 bedrooms, 2 bathrooms, one large kitchen, and 1 living room; would you consider living there with other mature individuals?

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